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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/265,432	03/10/1999	AKIHIRO TERADA	392.1627/JDH	4506

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EXAMINER

NGUYEN, THU V

ART UNIT	PAPER NUMBER
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3661

DATE MAILED: 07/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/265,432	Applicant(s) TERADA ET AL.	
	Examiner Thu Nguyen	Art Unit 3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-9 and 12-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-9 and 12-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The amendment filed on April 15, 2005 has been entered. By this amendment, claims 2-3, 10-11, 17-19 have been canceled. In view of the amended claim, the restriction requirement issued on October 18, 2002 has been withdrawn, accordingly, all claims 1, 4-9, 12-16 will be examined in this office action. All claims 1, 4-9, 12-16 are now pending in the application.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4-7, 9, 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al (US 4,507,042) in view of Yokoyama (US 4,602,345) and further in view of Hirai et al (US 5,770,936), and Nakano et al (EP 0 672 496) (IDS submitted on November 28, 2000).

As per claim 1, Suzuki teaches a robot system comprising: a movable arm with a plurality of links 12-13 (fig.1) and a wrist 14 (fig.1); and a tool unit 2 (fig.1) mounted on the wrist having an effecting end biased with a radial offset with the final rotational axis of the wrist (col.1, lines 56-63). Suzuki does not teach that the arm is controlled by a robot controller, that the cutting tool includes a variable axis, that the effecting end is a cutting end, and that only the final rotational axis of the movable arm is selectively rotated when performing operation on the

workpiece. However, Yokoyama teaches a controller for controlling the arm of the robot (col.4, lines 4-20), moreover, since Yokoyama teaches the capability to control movement of the robot arm or wrist, Yokoyama obviously encompasses teaching moving only the final rotation axis when only the turning of the wrist $+\alpha/-\alpha$ and $+\beta/-\beta$ is indicated. Further, Hirai teaches a cutting tool 23-24 (fig.2) together with the rectangular structure for the tool post to mount on including a variable axis (fig.2) (col.1, lines 26-66; col.2, lines 36-61). Hirai does not teach biasing the cutting end effector toward the final rotation axis, however, biasing the end effector toward a direction according to a specific need would have been obvious design choice, moreover, biasing an end effector toward the final axis would have been a known shape as disclosed by Nakano in fig.15 (element 466, 468). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement a well known controller and the cutting tool of Hirai in combination with the shape of the end effector taught by Nakano to the robot arm of Suzuki in order to facilitate moving the cutting tool around the object being cut.

As per claim 4-7, Hirai teaches both linear and rotary axis (fig.2).

As per claim 9, refer to claim 1 above. Further, Hirai teaches arranging the work piece 25 (fig.2) or 34 (fig.3) (and also Nakano teaches such the arrangement in fig.15) so that the central axis of the workpiece is aligned with the final rotation axis. And Yokoyama teaches the capability of rotating only the final rotation axis (refer to claim 1 above).

As per claim 12-15, refer to claims 4-7 above.

3. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al (US 4,507,042) in view of Yokoyama (US 4,602,345) and further in view of Hirai et al (US 5,770,936), and Thones et al (US 4,755,232)

As per claim 16, refer to claim 9 above concerning the structure of the robot. Moreover, Thones teaches arranging the workpiece 14 (fig.1) with central axis aligned with the final rotational axis of the moveable arm (fig.1, col.2, lines 59-68), rotating the final rotational axis to perform a hole on the workpiece (col.3, lines 18-23). Thones does not explicitly disclose moving the variable axis in synchronism with the final rotation axis, however, Thones teaches the capability of cutting a hole on the unevenness of the surface or the workpiece (col.1, lines 21-26), and Hirai teaches rotating the final axis and the variable axis (fig.2) in machining a workpiece. An ordinary person skilled in the art at the time the invention was made would be able to use the tool taught by Harai and to control rotationing of the final axis 20 (fig.1) and the tool piece of Harai in order to perform cutting hole on the uneven surface of the workpiece.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crisman et al (US 5,570,920) in view of Bruno ("Dexterous Telemanipulation with four Fingered Hand system").

As per claim 8, Crisman teaches a robot system comprising an arm 22 (fig.1) (col.2, lines 61-67; col.3, lines 1-6); a tool unit 10 (fig.1) having additional rotation axis between link 50 (fig.1) bias with respect to the final rotation axis and a variable axis between link 50 and 12

(fig.1). Crisman does not explicitly teaches a robot arm as claimed with controller having a software, and the movability of the arm, however, Crisman teaches that the end effector structure should be attached to a well known robot arm with a well known wrist structure (fig.1, col.2, lines 54-58), moreover, Bruno teaches a well known robot arm (the PUMA) with the controller (pare 338, second column, last paragraph), and the wrist structure that is operable like a human wrist (page 339, first column, last paragraph), since it would have been well known that the human wrist can rotate (around the final axis), Bruno encompasses teaching a wrist structure with the capability of rotation around the final axis. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to attach the end effector of Crisman to the robot with a controller and the wrist structure of the robot arm of Bruno in order to provide full motion of the robot arm as well as the end effector.

Response to Arguments

In response to applicant's argument on page 6, last paragraph, that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Suzuki teaches an industrial robot with the end effector 2 (fig.1) Hirai in the same context teaches an industrial robot with tool 23

(fig.1) having variable axis at the tool post 24 (fig.1). An ordinary person skilled in the art would be able to use the tool 23 with tool post 24 (fig.10 when adjustment of the tool height is required.

In response to applicant's argument on page 7, first paragraph, refer to the claim rejection on 35 USC 103 on claim 1 above.

In response to applicant's argument on page 7, on claim 9, Newly cited reference of Yokoyama teaches the robot with a plurality of links 6, 9 (fig.1) and wrist 15 (fig.1). Hirai teaches a variable axis 24 (fig.1). Furthermore, concerning rotating only final axis, refer to the claim rejection on 35 USC 103 on claim 1 above.

In response to applicant's argument on page 7-8, on claim 16, and 8 are moot in view of the new ground of rejection.

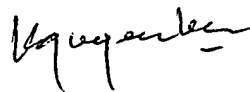
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu Nguyen whose telephone number is (571) 272-6967. The examiner can normally be reached on T-F (7:30-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3661

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

July 24, 2005



THUY V. NGUYEN
PRIMARY EXAMINER